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CLAIMS

[Claim(s)]
[Claim 1] The air duct with which the car was equipped, and the heat exchanger for air conditioning arranged in said air duct, In the conditioner for automobiles equipped with the blower which ventilates in said air duct, and two or more diffusers which ventilate the wind air-conditioned in said air duct A temperature detection means to detect the blowdown temperature in the diffuser formed in the center of an inner vehicle room front wall of said diffuser, A closing motion means to open and close the diffuser formed in inner vehicle room front wall both the sides of said diffuser, The conditioner for automobiles characterized by having the control unit which established the driving means which drives said closing motion means, and was detected by said temperature detection means, and which blows off, closes said closing motion means by said driving means based on temperature, and controls the blast weight of said blower a little.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the conditioner for automobiles which ventilates an air-conditioning wind.
[0002]
[Description of the Prior Art] Drawing 1 which is the block diagram of this invention is used and explained about the configuration of the conventional conditioner for automobiles. That is, the evaporator 2 and heater 33 which cool the air ventilated are arranged by the Maine duct 1. The blower fan 11 for ventilating an evaporator 2 in air is formed in the upstream of an evaporator 2, and a rotation drive is carried out by the blower motor 12. Furthermore, the damper 13 for an outside bashful switch to switch is formed [the open air or / whether it is crowded bashful twist picking and] in the air supplied to the blower fan 11, and drive control of the drive of a damper 13 is carried out by the control unit 90 with the actuators 61, such as a servo motor.
[0003] Point-to-point control of the air mix damper 31 is carried out to the opening location of arbitration by SA - BOMOTA 63 so that the air content which flows into a heater 33 with the air mix damper 31 may be adjusted and the air cooled by the evaporator 2 may become predetermined temperature.
[0004] The duct 71 for FOOT blowdown for ventilating crew's step and the defroster duct 72, and the duct 49 for face blowdown are connected with the Maine duct 1. Furthermore, the side face ducts 47 and 48 are installed by the face blowdown duct 49 towards vehicle room front wall both sides. The face diffusers 42 and 43 are formed in the vehicle interior of a room at the point in the form which carried out opening at the vehicle indoor front wall. Moreover, the central face diffuser 41 is formed in the duct 49 for face blowdown towards the center in a vehicle indoor front wall in the form which carried out opening to the vehicle interior of a room. The dampers 44, 45, and 46 for opening and closing a diffuser are formed in each diffuser, and each damper is operated by hand control, respectively.
[0005] The dampers 35 and 36 for opening and closing the inflow of air by which the temperature control was carried out from the Maine duct 1, respectively are formed in the joining segment with the Maine duct 1 of the duct 71 for FOOT blowdown, and the defroster duct 72. Dampers 35 and 36 are driven with the connected actuators 65 and 66, and the actuation is controlled by the control unit 90.
[0006] The face damper 34 for performing a ventilation switch into the duct 49 for face blowdown of the air in which the temperature control was carried out to the joining segment of the Maine duct 1 and the duct 49 for face blowdown by the abouchement of the MAX cool damper 32 for turning to the duct 49 for direct face blowdown the cooling wind cooled by the evaporator 2 and the air warmed with the heater core 33 is formed. The drive of the MAX cool damper 32 and the face damper 34 is driven with actuators 64 and 67, and the actuation is controlled by the control unit 90.
[0007] The temperature setter 55 for setting up the sensor 52 which measures vehicle indoor bashful ** Tr, the sensor 53 which detects outside air temperature Tam, the sensor 54 which detects intensity of radiation Ts, and the temperature for which crew wishes further is connected to the control unit 90.

[0008] A control unit 90 is constituted by the so-called microcomputer system etc., and controls each actuator and the blower motor 12 based on the setting room temperature Tset by the above-mentioned detecting signal and the above-mentioned room temperature setter 55 of each sensor.
[0009] In such a configuration, the control approach as shown in the flow chart in drawing 4 was enforced conventionally. That is, initial setting, such as a setup of the multiplier which the initial state in each diffuser sets up or calculates in step 201, is performed, and in step 202, from each sensor, the data of bashful ** Tr, outside air temperature Tam, and intensity of radiation Ts are read, and it is inputted into a control unit 90. Moreover, the laying temperature Tset which crew wishes is read from the temperature setter 55. Next, at step 203, target blowdown sky atmospheric temperature Tao calculates from these data according to the function f1 set up beforehand. Subsequently, the opening Sw of the air mix damper 31 corresponding to target blowdown sky atmospheric temperature Tao calculates at step 204 based on a function f2. Subsequently, in step 205, the output voltage to the blower motor 12 corresponding to said Tao is set up, inside-and-outside mind inhalation opening Mohd is set up at step 206, and positioning of the inside-and-outside mind switch damper 13 is performed. And diffuser Mohd is set up at step 207. Four Mohd is set up corresponding to Tao, closing motion control of the damper corresponding to each mode etc. switches diffuser Mohd automatically, and he is controlled. There are MAXFACE Mohd, FACE Mohd, bilevel (B/L) Mohd, and FOOT Mohd as Mohd from the low order of Tao. MAXFACE Mohd is in the condition that the face damper 34 and dampers 35 and 36 are closed, and Kaisei of the MAX cool damper 32 is carried out. FACE Mohd It is in the condition which closes the MAX cool damper 32 in FACE Mohd, and carries out Kaisei of the face damper 34. A bilevel mode In the condition that dampers 32 and 36 close and Kaisei of the dampers 35 and 34 is carried out The way of the air ventilated to the duct 49 for face blowdown so that the flow rate to the heater core 33 may be adjusted by opening adjustment of the air mix damper 31 and the wind cooled by the evaporator 2 may be in a keeping-one's-head-cool-and-feet-warm condition to crew The wind by which the temperature control was carried out so that it might be ventilated in the condition that temperature is lower than the air ventilated by the FOOT duct is supplied to the duct 49 for face blowdown, and the FOOT duct 71. FOOT Mohd is Mohd in the condition that all dampers other than damper 35 for FOOT ducts are closed.
[0010] If diffuser Mohd corresponding to Tao calculated in step 207 is set up, air-conditioning control will be henceforth carried out continuously by step 202 return and by inputting the data from each sensor again, repeating the control action to step 207 and performing it.
[0011]
[Problem(s) to be Solved by the Invention] A room temperature is high, and it becomes low, and when left by the car all over the summer flame world, since there is very much intensity of radiation, the target blowdown temperature Tao calculated in step 203 switches to the location (location shown as the continuous line in drawing 1) which intercepts the inflow of the air to the heater core 33, and is positioned [the target air mix damper opening Sw in step 204 serves as max, and] in such control. Furthermore in step 205, the programmed voltage to the blower motor 12 turns into a maximum voltage, the blower fan 11 is changed into the condition of carrying out the maximum airflow discharge, and the inside-and-outside mind switch damper 13 is switched to the location (location shown by the dotted line in drawing 1) which intercepts the inhalation from the open air so that it may be in the condition that inside-and-outside mind inhalation opening Mohd incorporates only inner mind at step 206. And in step 207, diffuser Mohd turns into MAXFACE Mohd, and the closing motion dampers 36 and 35 in the defroster duct 72 and the FOOT duct 71 are switched to a closing location (location shown as the continuous line in drawing 1) which intercepts the inflow of the air to each duct, and it is positioned. Furthermore, the face damper 34 is closed (location shown as the continuous line in drawing 1), and setting control is carried out so that the chisel of the cooling style may be ventilated with the maximum blast weight only from the face diffusers 41, 42, and 43 considering the MAX cool damper 32 as an open condition (location of the continuous line in drawing 1).
[0012] Therefore, during summer flame world parking, by solar radiation, in the condition that each device of the vehicle interior of a room, the duct of an air conditioner, etc. serve as an elevated

temperature of 50 degrees or more, if a conditioner operates like the above, the hot air which was piling up in the duct will blow off from each face diffusers 41, 42, and 43 to in the car at a stretch. Furthermore, such a hot wind blows off until each whole device and whole duct of an air conditioner get cold, and unless it passes for a while, desired cold blast does not blow off. Therefore, a result which gives displeasure further by spraying by the hot wind of an air conditioner to crew while in the car is an elevated temperature is brought. Moreover, although there is the approach of preventing crew's closing the face duct entrances 41 and 42 and 43 grades manually, and spraying him on **** etc. in warm air as an approach of avoiding such a thing each time In such a case, it learns, if it does not work to it, extending a hand to the diffuser which a hand cannot reach easily each time, there is complicatedness, and in that case, for a while, the direct ventilation to crew of the cooling style is interrupted, and the elevated-temperature condition of the vehicle interior of a room must be put up with too. Moreover, since it does not know when ventilation changed into the cooling condition in that case, there is a fault which cannot perform a timely ventilation switch, either.

[0013] When this invention is made in view of the above-mentioned situation and takes the car in a summer flame world especially, it ventilates a cooling wind for a short time to crew at the time of starting of an air conditioner, and aims at performing ventilation control which gives a comfortable feeling.

[0014]

[Means for Solving the Problem] The air duct with which the car was equipped in order that this invention might attain the above-mentioned purpose, In the conditioner for automobiles equipped with the heat exchanger for air conditioning arranged in said air duct, the blower which ventilates in said air duct, and two or more diffusers which ventilate the wind air-conditioned in said air duct A temperature detection means to detect the blowdown temperature in the diffuser formed in the center of an inner vehicle room front wall of said diffuser, A closing motion means to open and close the diffuser formed in inner vehicle room front wall both the sides of said diffuser, The driving means which drives said closing motion means is established, it blows off, said closing motion means is closed by said driving means based on temperature, and the technical means of having the control unit which was detected by said temperature detection means and which controls the blast weight of said blower a little are provided.

[0015]

[Function] Since the conditioner for automobiles by this invention detects the temperature of the wind discharged from a diffuser and controls closing motion of blast weight and a diffuser based on the detected temperature So that in the car may be ventilated by the front wall in the car only from the diffuser formed in the center at the time of an elevated temperature It acts so that the wind cooled from the diffuser formed in the center of an in-the-car front wall may be ventilated to crew, at the same time it closes the closing motion means of both the side diffuser formed in the front wall in the car, it sets up the blast weight of a blower a little and an air conditioner starts.

[0016]

[Example] This invention is explained based on the example shown in drawing below. Drawing 1 is the block diagram showing one example of the equipment which carries out this invention.

[0017] The evaporator 2 and heater 33 which cool the air ventilated are arranged by the Maine duct 1. The blower fan 11 for ventilating an evaporator 2 in air is formed in the upstream of an evaporator 2, and a rotation drive is carried out by the blower motor 12. The damper 13 for an outside bashful switch to switch is formed [the open air or / whether it is crowded bashful twist picking and] in the air furthermore supplied to the blower fan 11, and drive control of the drive of a damper 13 is carried out by the control unit 90 with the driving gears 61, such as a servo motor.

[0018] Point-to-point control of the air mix damper 31 is carried out to the opening location of arbitration by SA - BOMOTA 63 so that the air content which flows into a heater 33 with the air mix damper 31 may be adjusted and the air cooled by the evaporator 2 may become predetermined temperature.

[0019] The duct 71 for FOOT blowdown for ventilating crew's step and the defroster duct 72, and the

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 06-122318
(43)Date of publication of application : 06.05.1994

(51)Int.Cl. B60H 1/00
B60H 1/00

(21)Application number : 04-272845
(22)Date of filing : 12.10.1992

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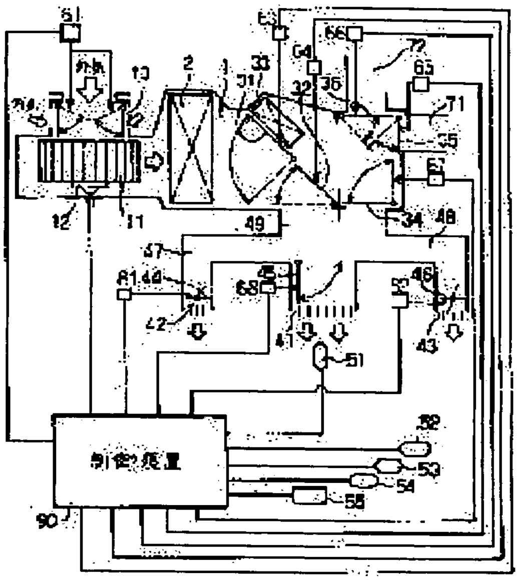
(54) CAR AIR CONDITIONER

(57)Abstract:
PURPOSE: To send the cooling wind in a short time and make the blast control giving the comfortable feeling to the occupant when an air conditioner is started at the high-temperature state in the car room of a vehicle under the blazing sun in summer.
CONSTITUTION: An air conditioner is provided with a main duct 1 provided on a vehicle, an evaporator 2 arranged on the main duct 1, a blower fan 12 feeding air to the evaporator 2, a sensor 51 detecting the hot air at a center face blowout port 41, and actuators 81, 82 opening or closing the dampers 44, 46 at side face blowout ports 42, 43. The dampers 44, 46 are closed by a control device 90 when a car room is kept at a high temperature, and the cooling wind is sent from only the center face blowout port 41.



LEGAL STATUS

[Date of request for examination]
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of rejection]
[Date of requesting appeal against examiner's decision of rejection]
[Date of extinction of right]

引用文献6

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（A）　(11)特許出願公開番号

特開平6－122318

(43)公開日　平成６年(1994)５月６日

(51)Int.Cl.^{5}	識別記号		FI
B60H　1/00	103	P	
	101	X	

審査請求　未請求　請求項の数１　（全８頁）

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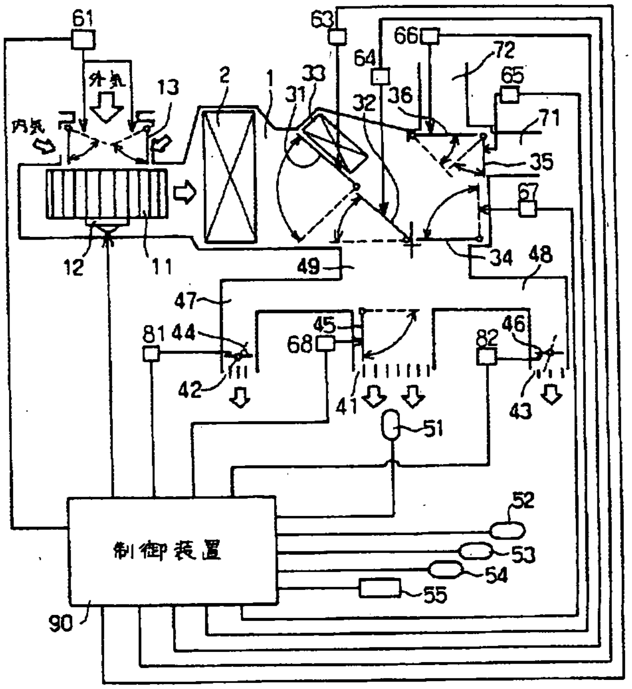
(54)【発明の名称】自動車用空気調和装置

(57)【要約】

【目的】　夏期炎天下中の車両等における車室内が高温状態に際し，空調装置の起動時において乗員に対し，短時間に冷却風を送風し，快適感を与えるような送風制御を行う。

【構成】　車両に設けられたメインダクト１と，メインダクト１に配設されたエバポレータ２と，エバポレータ２に送風するブロワファン１２が配設された空気調和装置において，中央フェイス吹き出し口４１における温度を検出するセンサ５１と，サイドフェイス吹き出し口４２，４３におけるダンパ４４，４６を開閉駆動するアクチュエータ８１，８２が設けられており，制御装置９０によって，室内が高温時，ダンパ４４，４６を閉成し，中央フェイス吹き出し口４１のみから冷却風を送風するよう制御する。



【特許請求の範囲】

【請求項１】　車両に装備したエアダクトと，前記エアダクト内に配設した冷房用熱交換器と，前記エアダクト内に送風する送風機と，前記エアダクトにおいて空調された風を送風する複数の吹き出し口とを備えた自動車用空気調和装置において，前記吹き出し口の内車室前壁中央に設けられた吹き出し口における吹き出し温度を検出する温度検出手段と，前記吹き出し口の内車室前壁両サイドに設けられた吹き出し口を開閉する開閉手段と，前記開閉手段を駆動する駆動手段とを設け，前記温度検出手段により検出された吹き出し温度に基づいて，前記駆動手段により前記開閉手段を閉成し，前記送風機の送風量を少量に制御する制御装置とを備えたことを特徴とする自動車用空気調和装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は，空調風を送風する自動車用空気調和装置に関する。

【０００２】

【従来の技術】従来の自動車用空気調和装置の構成について本発明の構成図である図１を援用して説明する。即ち，メインダクト１には送風される空気を冷却するエバポレータ２及び加熱器３３が配設されている。エバポレータ２の上流にはエバポレータ２へ空気を送風するためのブロワファン１１が設けられており，ブロワモータ１２によって回転駆動される。さらに，ブロワファン１１へ供給される空気を外気もしくは内気より取り込むかを切り換える外内気切り換え用ダンパ１３が設けられており，ダンパ１３の駆動はサーボモータ等のアクチュエータ６１によって制御装置９０により駆動制御される。

【０００３】エバポレータ２によって冷却された空気はエアミックスダンパ３１によりヒータ３３へ流入する空気量が調整され，所定の温度になるようサーボモータ６３によって，任意の開度位置にエアミックスダンパ３１が位置決め制御される。

【０００４】メインダクト１には乗員の足元へ送風するためのＦＯＯＴ吹き出し用ダクト７１及びデフロスタダクト７２，フェイス吹き出し用ダクト４９が連結されている。さらにフェイス吹き出しダクト４９には，車室前壁両サイドへ向けて，サイドフェイスダクト４７，４８が延設されている。その先端部には，車室内へ開口した形で車室内前壁にフェイス吹き出し口４２，４３が設けられている。また，フェイス吹き出し用ダクト４９には車室内前壁における中央に向けて車室内へ開口した形で中央フェイス吹き出し口４１が設けられている。各吹き出し口には，吹き出し口を開閉するためのダンパ４４，４５，４６が設けられており，各ダンパは，それぞれ手動により操作される。

【０００５】ＦＯＯＴ吹き出し用ダクト７１及びデフロスタダクト７２のメインダクト１との連結部分には，それぞれメインダクト１からの温度調整された空気の流入を開閉するためのダンパ３５，３６が設けられている。ダンパ３５，３６は，接続されたアクチュエータ６５，６６によって駆動され，その動作は制御装置９０によって制御される。

【０００６】メインダクト１とフェイス吹き出し用ダクト４９との連結部分には，エバポレータ２によって冷却された冷却風を直接フェイス吹き出し用ダクト４９へ向けるためのＭＡＸクールダンパ３２と，ヒータコア３３によって暖められた空気との混流により温度調整された空気のフェイス吹き出し用ダクト４９への送風切り換えを行うためのフェイスダンパ３４が設けられている。ＭＡＸクールダンパ３２及びフェイスダンパ３４の駆動はアクチュエータ６４，６７によって駆動され，その動作は制御装置９０によって制御される。

【０００７】制御装置９０には車室内における内気温Ｔｒを測定するセンサ５２，外気温Ｔａｍを検出するセンサ５３，日射量Ｔｓを検出するセンサ５４，さらに乗員が希望する温度を設定するための温度設定器５５が接続されている。

【０００８】制御装置９０は，いわゆるマイクロコンピュータシステム等により構成されるもので，前述の各センサの検出信号と室温設定器５５による設定室温Ｔｓｅｔとに基づいて，各アクチュエータ及びブロワモータ１２を制御する。

【０００９】このような構成において，従来，図４におけるフローチャートに示すような制御方法が実施されていた。即ち，ステップ２０１において各吹き出し口における初期状態の設定，または演算される係数の設定等の初期設定が行われ，ステップ２０２において各センサより内気温Ｔｒ，外気温Ｔａｍ，日射量Ｔｓのデータが読み出され，制御装置９０に入力される。また，温度設定器５５より，乗員の希望する設定温度Ｔｓｅｔが読み込まれる。次にステップ２０３にて，これらのデータから，あらかじめ設定されている関数ｆ１に従って，目標吹き出し空気温Ｔａｏが演算される。次いで，目標吹き出し空気温Ｔａｏに対応するエアミックスダンパ３１の開度Ｓｗが関数ｆ２に基づいてステップ２０４にて演算される。ついでステップ２０５において前記Ｔａｏに対応するブロワモータ１２への出力電圧が設定され，ステップ２０６にて内外気吸入口モードが設定され，内外気切り換えダンパ１３の位置決めが行われる。そして，ステップ２０７にて，吹き出し口モードが設定される。吹き出し口モードは，Ｔａｏに対応して４つのモードが設定されており，各モードに対応するダンパ等の開閉制御が自動的に切り換え制御される。モードには，Ｔａｏの低い順からＭＡＸＦＡＣＥモード，ＦＡＣＥモード，バイレベル（Ｂ／Ｌ）モード，ＦＯＯＴモードがある。ＭＡＸＦＡＣＥモードは，フェイスダンパ３４，ダンパ３５，３６が閉成され，ＭＡＸクールダンパ３２が開成さ

れる状態であり，ＦＡＣＥモードは，ＦＡＣＥモードにおけるＭＡＸクールダンパ３２を閉成し，フェイスダンパ３４を開成する状態であり，バイレベルモードは，ダンパ３２，３６が閉成し，ダンパ３５及び３４が開成される状態で，エバポレータ２により冷却された風がエアミックスダンパ３１の開度調整により，ヒータコア３３への流量が調整され，乗員に対し頭寒足熱状態になるようフェイス吹き出し用ダクト４９へ送風される空気のほうが，ＦＯＯＴダクトに送風される空気よりも温度が低い状態で送風されるよう温度調整された風がフェイス吹き出し用ダクト４９及びＦＯＯＴダクト７１へ供給される。ＦＯＯＴモードは，ＦＯＯＴダクト用ダンパ３５以外のダンパが全て閉成される状態のモードである。

【００１０】ステップ２０７において演算されたＴａｏに対応する吹き出し口モードが設定されると，以後，ステップ２０２に戻り，再び各センサからのデータを入力し，ステップ２０７までの制御動作を繰り返し行うことにより，空調制御が継続的に実施される。

【００１１】

【発明が解決しようとする課題】このような制御において，車両が夏期炎天下中に放置されているような場合，室温が高く，日射量が非常に多いため，ステップ２０３において演算される目標吹き出し温度Ｔａｏは低くなり，ステップ２０４における目標エアミックスダンパ開度Ｓｗが最大となりヒータコア３３への空気の流入を遮断する位置（図１における実線で示す位置）に切り換え位置決めされる。さらにステップ２０５においてブロワモータ１２への設定電圧が最高電圧となりブロワファン１１を最大風量排出する状態にし，ステップ２０６にて内外気吸入口モードが内気だけを取り込む状態になるよう内外気切り換えダンパ１３を外気からの吸入を遮断する位置（図１における点線で示す位置）に切り換えられる。そして，ステップ２０７において吹き出し口モードがＭＡＸＦＡＣＥモードとなり，デフロスタダクト７２及びＦＯＯＴダクト７１における開閉ダンパ３６，３５をそれぞれのダクトへの空気の流入を遮断するような閉成位置（図１における実線にて示す位置）に切り換え位置決めされる。さらに，フェイスダンパ３４を閉じ（図１における実線で示す位置），ＭＡＸクールダンパ３２を開状態（図１における実線の位置）としてフェイス吹き出し口４１，４２，４３のみから冷却風のみが，最大の送風量で送風されるように設定制御される。

【００１２】そのため，夏期炎天下駐車中において，日射により，車室内の各機器及び空調装置のダクト等も５０度以上の高温となるような状態で，上記の如く空気調和装置が作動すると，ダクト内に滞留していた高温の空気が，一気に車内へ各フェイス吹き出し口４１，４２，４３より吹き出される。さらに，このような高温の風は，空調装置の各機器及びダクト全体が冷えるまで吹き出され，暫くの間経過しないと所望の冷風が吹き出されてこない。そのため，乗員に対し車内が高温である中で，空調装置からの高温の風による吹きつけによってさらに不快感を与える結果となっている。また，そのようなことを避ける方法として，乗員がその都度，フェイスダクト口４１，４２，４３等を，手動にて閉じて温風を顔部等へ吹き付けられるのを防ぐ方法があるが，このような場合，その都度手が届きにくいような吹き出し口へも手を延ばして作業しなければならい煩雑さがあり，また，その場合やはり暫くの間，乗員への直接的な冷却風の送風が遮られ，車室内の高温状態を我慢しなければならない。また，その場合いつ送風が冷却状態になったかどうかがわからないため，適時な送風切り換えも行うことができない欠点がある。

【００１３】本発明は，上記事情に鑑みてなされたもので，特に夏期炎天下中の車両に乗車した際に，空調装置の起動時において乗員に対し短時間に冷却風を送風し，快適感を与えるような送風制御を行うことを目的とする。

【００１４】

【課題を解決するための手段】本発明は，上記目的を達成するために，車両に装備したエアダクトと，前記エアダクト内に配設した冷房用熱交換器と，前記エアダクト内に送風する送風機と，前記エアダクトにおいて空調された風を送風する複数の吹き出し口とを備えた自動車用空気調和装置において，前記吹き出し口の内車室前壁中央に設けられた吹き出し口における吹き出し温度を検出する温度検出手段と，前記吹き出し口の内車室前壁両サイドに設けられた吹き出し口を開閉する開閉手段と，前記開閉手段を駆動する駆動手段とを設け，前記温度検出手段により検出された吹き出し温度に基づいて，前記駆動手段により前記開閉手段を閉成し，前記送風機の送風量を少量に制御する制御装置を備えるという技術的手段を具備するものである。

【００１５】

【作用】本発明による自動車用空気調和装置は，吹き出し口より排出される風の温度を検出し，検出された温度に基づいて送風量及び吹き出し口の開閉を制御するので車内が高温時，車内前壁に中央に設けられた吹き出し口のみから送風されるように車内前壁に設けられた両サイド吹き出し口の開閉手段を閉成し，送風機の送風量を少量に設定し，空調装置が起動すると同時に，車内前壁中央に設けられた吹き出し口より冷却された風を乗員に対し送風するように作用する。

【００１６】

【実施例】以下本発明を図に示す実施例に基づいて説明する。図１は本発明を実施する装置の一実施例を示す構成図である。

【００１７】メインダクト１には送風される空気を冷却するエバポレータ２及び加熱器３３が配設されている。エバポレータ２の上流にはエバポレータ２へ空気を送風

するためのブロワファン１１が設けられており，ブロワモータ１２によって回転駆動される。さらにブロワファン１１へ供給される空気を外気もしくは内気より取り込むかを切り換える外内気切り換え用ダンパ１３が設けられており，ダンパ１３の駆動はサーボモータ等の駆動装置６１によって制御装置９０により駆動制御される。

【００１８】エバポレータ２によって冷却された空気はエアミックスダンパ３１によりヒータ３３へ流入する空気量が調整され，所定の温度になるようサーボモータ６３によって，任意の開度位置にエアミックスダンパ３１が位置決め制御される。

【００１９】メインダクト１には乗員の足元へ送風するためのＦＯＯＴ吹き出し用ダクト７１及びデフロスタダクト７２，フェイス吹き出し用ダクト４９が連結されている。さらにフェイス吹き出しダクト４９より，車室前壁両サイドへ向けて，サイドフェイスダクト４７，４８が延設されている。その先端部には，車室内へ開口した形で車室内前壁にサイドフェイス吹き出し口４２，４３が設けられている。また，フェイス吹き出し用ダクト４９より車室内前壁における中央に向けて車室内へ開口した形で中央フェイス吹き出し口４１が設けられている。各吹き出し口には，吹き出し口を開閉するためのダンパ４４，４５，４６が設けられており，各ダンパは，アクチュエータ８１，６８，８２によって，開閉駆動され，その作動は制御装置９０によって制御される。

【００２０】ＦＯＯＴ吹き出し用ダクト７１及びデフロスタダクト７２のメインダクト１との連結部分には，それぞれメインダクト１からの温度調整された空気の流入を開閉するためのダンパ３５，３６が設けられている。ダンパ３５，３６は，接続されたアクチュエータ６５，６６によって開閉駆動され，その作動は制御装置９０によって制御される。

【００２１】メインダクト１とフェイス吹き出し用ダクト４９との連結部分には，エバポレータ２によって冷却された冷却風を直接フェイスダクト４９へ向けるためのＭＡＸクールダンパ３２と，ヒータコア３３によって暖められた空気との混流により温度調整された空気のフェイスダクト吹き出し用ダクト４９への送風切り換えを行うためのフェイスダンパ３４が設けられている。ＭＡＸクールダンパ６４及びフェイスダンパ３４の駆動はアクチュエータ６４，６７によって駆動され，その動作は制御装置９０によって制御される。

【００２２】制御装置９０には車室内における内気温Ｔｒを測定するセンサ５２，外気温Ｔａｍを検出するセンサ５３，日射量Ｔｓを検出するセンサ５４，及び乗員が希望する温度を設定するための温度設定器５５が接続されている。さらに本発明の特徴の一つである中央フェイス吹き出し口４１における温度Ｔｄを検出するセンサ５１が制御装置９０に接続されている。

【００２３】制御装置９０は，いわゆるマイクロコンピュータシステム等により構成されるもので，前述の各センサの検出信号と室温設定器５５による設定室温とに基づいて，各アクチュエータ及びブロワモータ１２を制御する。

【００２４】次に作動について説明する。図２及び図３は本装置の制御動作に関するフローチャートである。本装置の起動により制御動作が開始し，まずステップ１０１において，以下説明する本発明における空調制御を中央フェイス吹き出し口４１における温度が何度以上の場合に行うかを設定するための室内高温度Ｔ１，乗員が冷却感を感じる判別レベルとしての皮膚設定温度Ｔ２，ブロワファン１１を回転させる為のブロワモータ１２への出力電圧Ｖ１，ブロワファン１１を最高回転数で回転させるためのブロワモータ１２への最高設定電圧Ｖ２，ブロワモータ１２への出力電圧上昇率最小設定単位ΔＶ等の予め設定されている初期設定値が制御装置９０によって読み出される。本実施例においては，例えばＴ１＝５０°Ｃ，Ｔ２＝３０°Ｃ，Ｖ２＝１２Ｖ，ΔＶ＝１Ｖが設定される。

【００２５】次にステップ１０２において各センサからの温度検出等データ入力が行われる。即ち，室温設定器５５より設定された室温Ｔｓｅｔが読み込まれ，内気温Ｔｒがセンサ５２より検出され，外気温Ｔａｍがセンサ５３より検出され，日射量Ｔｓがセンサ５４より読み込まれる。さらにセンサ５１によって中央フェイス吹き出し口４１における温度Ｔｄが検出され，それぞれ制御装置９０に各データが入力される。次にステップ１０３において冷凍サイクルを起動させ，図示しないコンプレッサより冷媒をエバポレータ２に供給する。

【００２６】その状態でステップ１０４においてフェイス吹き出し口４１における温度Ｔｄが室内高温度Ｔ１より高温であるかどうかを判別する。吹き出し口４１における温度Ｔｄが室内高温度Ｔ１よりも高温である場合ステップ１０４にて『ＹＥＳ』と判別し，以下ステップ１０５から１１７までの制御を実施し，その後吹き出し口温度センサ５１を用いない図３にしたがった前述の通常の目標吹き出し空気温Ｔａｏ制御が行われる。また，ステップ１０４にて吹き出し口温度Ｔｄが既に室内高温度Ｔ１以下である場合はステップ１０４にて『ＮＯ』と判別し，ステップ１０５から１１７までの制御を実施することなく前述したような通常の目標吹き出し空気温Ｔａｏ制御を実施する。

【００２７】ステップ１０４にて『ＹＥＳ』と判別されると，次にステップ１０５にてエアミックスダンパ３１をＭＡＸＣＯＯＬ側即ち最大開度状態になるよう制御装置９０よりアクチュエータ６３へ指示する。次にステップ１０６にて内外気吸い込み口モードを内気のみの吸い込み状態となるよう内外気切り換えダンパ１３を外気側吸入口を遮断する位置（図１における点線で示す位置）に位置決めするよう駆動制御する。次にステップ１０７

においてＦＯＯＴ吹き出しダクト用ダンパ３５を閉じ，ステップ１０８にてデフロスタ吹き出し口からの送風を遮断するためにダンパ３６を閉成（図１における実線で示す位置）し，ステップ１０９にてＭＡＸクールダンパ３２を開成（図１における実線で示す位置）し，ステップ１１０においてフェイスダンパ３４を閉成する（図１における実線で示す位置）。さらにステップ１１１において両サイドフェイス吹き出し口４２，４３における開閉ダンパ４４，４６を閉成する（図１における実線で示す位置）。その状態でステップ１１２にて制御装置９０よりブロワモータ１２への出力電圧Ｖ１に最低電圧が出力され，ブロワファン１１が最低回転数で回転する。すると，本装置におけるフェイス吹き出し口は中央フェイス吹き出し口４１を除き，閉成された状態となっているので，ブロワファン１１より少量の風量が送風され，エバポレータ２によって冷却され，ＭＡＸクールダンパ３２によって開口された部分を通じて直接吹き出し口４１より車内へ送風される。そのとき，吹き出し口４２，４３はそれぞれダンパ４４，４６によって閉成されているので，ダクト４７，４８内は，メインダクト１よりも内圧が高くなるため，送風される風がダクト４７，４８へ流れ込むことはない。そのため，冷却された風は，その流路が短縮された形となり，高温になっているダクト内の冷却を短時間で行うことができる。

【００２８】次にステップ１１３において中央フェイス吹き出し口４１における温度Ｔｄが皮膚設定温度Ｔ２よりも低いかどうかを判別する。もし低くなければ，『ＮＯ』と判断し，ステップ１１に戻り，ブロワモータ１２に，最低電圧を送り続け，最低回転状態による最低送風量状態を維持する。その後，エバポレータ２から吹き出し口４１までの短縮された経路におけるダクト等が冷却されると，吹き出し口における温度Ｔｄが皮膚設定温度Ｔ２より低くなるので，そのような状態になったとき，ステップ１１３において『ＹＥＳ』と判断し，ステップ１１４に移り，ブロワモータ１２への出力電圧Ｖ１を最小設定単位電圧ΔＶだけ増加させる。そして新たに設定された電圧Ｖ１が最高設定電圧Ｖ２より高いかどうかを判別し，高い場合は，『ＹＥＳ』と判断し，ステップ１１６へ進む。また，低い場合には『ＮＯ』と判断し，ステップ１１２へ戻り，再びステップ１１４にて設定電圧Ｖ１をΔＶだけ増加させ，最高設定電圧Ｖ２を越えるまでＶ１の増加を繰り返す。その際，設定電圧Ｖ１の増加による送風量の増加かから冷却効果が下がり，吹き出し温度が皮膚温度を越えないようチェックする必要があるため，最高電圧を越えるまでの間はステップ１１３にて吹き出し温度Ｔｄのチェックを繰り返す。設定電圧Ｖ１が最高電圧Ｖ２を越えた場合ステップ１１６に進み，両サイドフェイス吹き出し口におけるダンパ４４，４６を開成する。続いてステップ１１７にてフェイスダンパ３４を開成し，以後図３１に示すような通常のＴａｏ制御動作を実施するよう制御される。

【００２９】尚，図２におけるステップ１０６において，内外気吸入モードを内気状態としたが，内気温よりも外気温の方が低い場合には，外気温を吸入する状態に設定すれば，さらに効率のよい冷却制御を行うことができる。

【００３０】

【発明の効果】以上の説明から明らかなように，本発明の空気調和装置は，車両に装備したエアダクトと，前記エアダクト内に配設した冷房用熱交換器と，前記エアダクト内に送風する送風機と，前記エアダクトにおいて空調された風を送風する複数の吹き出し口とを備えた自動車用空気調和装置において，前記吹き出し口の内車室前壁中央に設けられた吹き出し口における吹き出し温度を検出する温度検出手段と，前記吹き出し口の内車室前壁両サイドに設けられた吹き出し口を開閉する開閉手段と，前記開閉手段を駆動する駆動手段とを設け，前記温度検出手段により検出された吹き出し温度に基づいて，前記駆動手段により前記開閉手段を閉成し，前記送風機の送風量を少量に制御する制御装置とを備える構成としたので，車内が高温時，空調装置の起動時においても，高温の温風が一気にフェイス吹き出し口より吹き出すことがなく，乗員に対して，短時間に吹き出し口から冷却風を送風し，快適感を与えることが可能となる。

【図面の簡単な説明】

【図１】本発明における自動車用空調装置の全体構成図。

【図２】本装置における制御フローチャートの前段部。

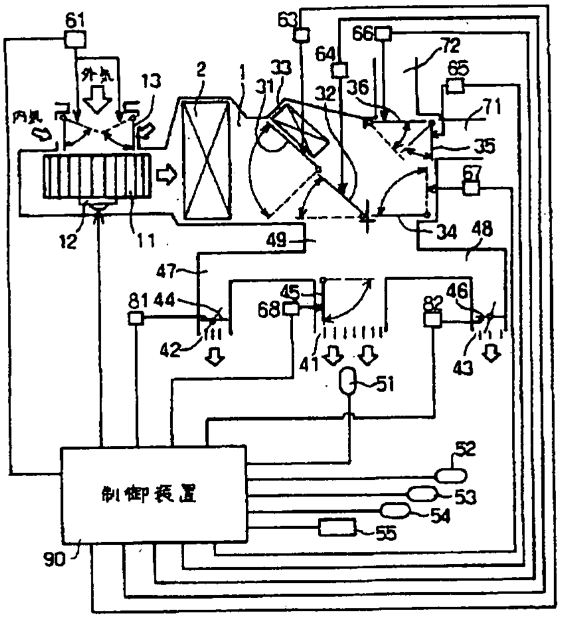
【図３】本装置における制御フローチャートの後段部。

【図４】従来の空調装置における制御フローチャート図。

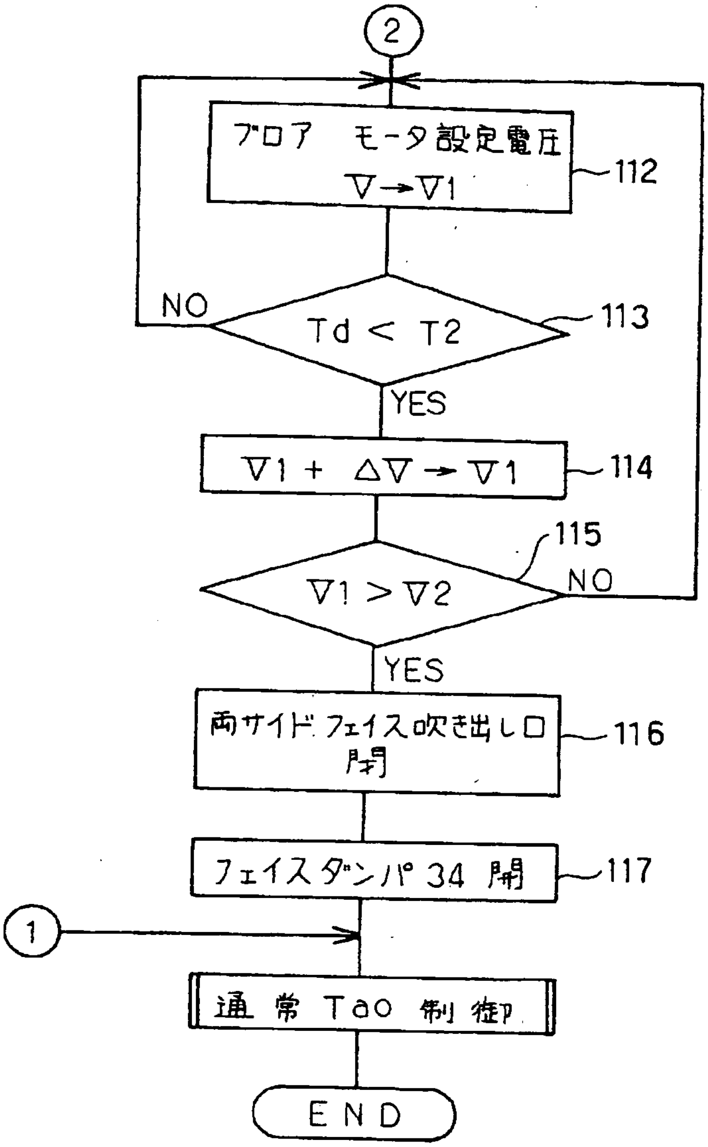
【符号の説明】

１	メインダクト
２	エバポレータ
１１	ブロワファン
１２	ブロワモータ
４４，４６	ダンパ
５１	中央フェイス吹き出し口温度センサ
８１，８２	ダンパ駆動用アクチュエータ
９０	制御装置

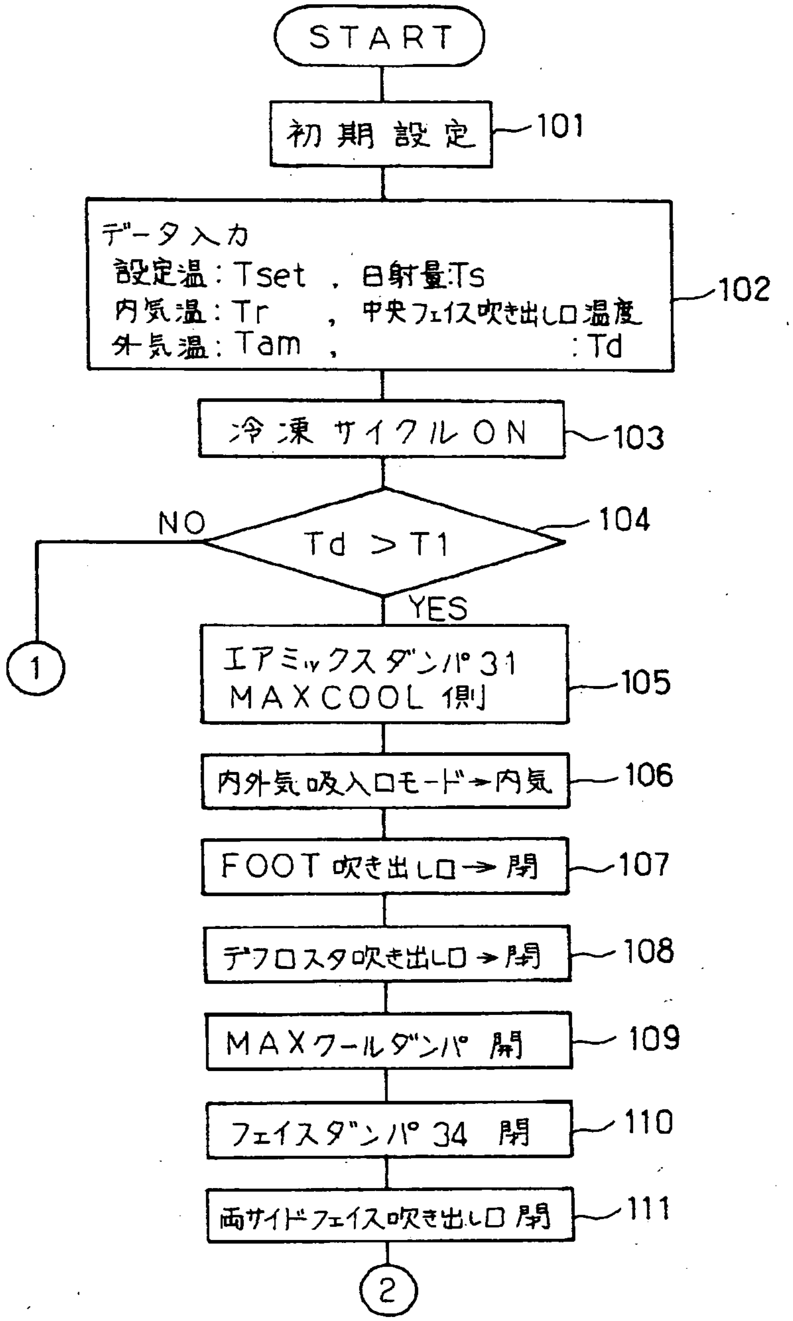
【図１】


外気
内気
制御装置

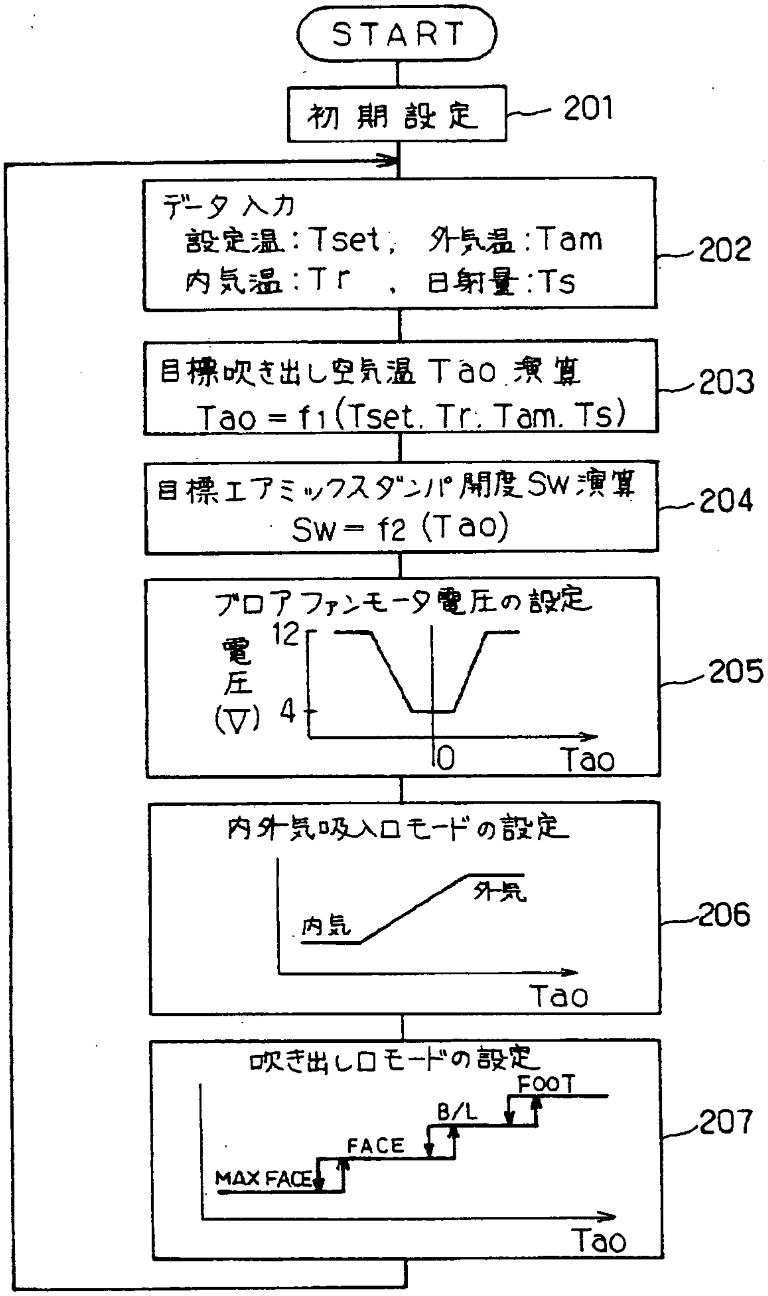
【図３】


②
ブロア　モータ設定電圧
V→V1
112
NO
Td < T2
113
YES
V1 + ΔV → V1
114
115
V1 > V2
NO
YES
両サイドフェイス吹き出し口
開
116
フェイスダンパ34 開
117
①
通常 Tao 制御
END

【図２】


START
初期設定
101
データ入力
設定温：Tset ，日射量：Ts
内気温：Tr ，中央フェイス吹き出し口温度
外気温：Tam ，：Td
102
冷凍サイクルON
103
Td ＞ T1
104
NO
YES
1
エアミックスダンパ31
MAXCOOL側
105
内外気吸入口モード→内気
106
FOOT吹き出し口→閉
107
デフロスタ吹き出し口→閉
108
MAXクールダンパ 開
109
フェイスダンパ34 閉
110
両サイドフェイス吹き出し口 閉
111
2

【図４】


START
初期設定
201
データ入力
設定温：Tset，外気温：Tam
内気温：Tr，日射量：Ts
202
目標吹き出し空気温 Tao 演算
Tao＝f1(Tset, Tr, Tam, Ts)
203
目標エアミックスダンパ開度SW演算
SW＝f2(Tao)
204
ブロアファンモータ電圧の設定
12
電圧
(V)
4
0
Tao
205
内外気吸入口モードの設定
内気
外気
Tao
206
吹き出し口モードの設定
MAX FACE
FACE
B/L
FOOT
Tao
207

step 104, and the usual target blowdown sky atmospheric temperature Tao control which was mentioned above, without carrying out control to steps 105-117 is carried out.

[0027] If distinguished from "YES" at step 104, it is directed next at step 105 that the air mix damper 31 is on the MAXCOOL side, i.e., the maximum opening condition, from a control device 90 to an actuator 63. Next, drive control is carried out so that it may be in the suction condition of a bashful chisel about inside-and-outside mind absorption opening Mohd at step 106 and the inside-and-outside mind switch damper 13 may be positioned in the location (location shown by the dotted line in drawing 1) which intercepts open air side inhalation opening. Next, in step 107, the damper 35 for FOOT blowdown ducts is closed, in order to intercept the ventilation from a defroster diffuser at step 108, a damper 36 is closed (location shown as the continuous line in drawing 1), Kaisei (location shown as the continuous line in drawing 1) of the MAX cool damper 32 is carried out at step 109, and the face damper 34 is closed in step 110 (location shown as the continuous line in drawing 1). Furthermore in step 111, the closing motion dampers 44 and 46 in both the side face diffusers 42 and 43 are closed (location shown as the continuous line in drawing 1). The minimum electrical potential difference is outputted to the output voltage V1 to the blower motor 12 from a control device 90 at step 112 by the condition, and the blower fan 11 rotates with a minimum engine speed. Then, since the face diffuser in this equipment is in the condition of having been closed, except for the central face diffuser 41, airflow more nearly little than the blower fan 11 is ventilated, and it is cooled by the evaporator 2 and ventilated from the direct diffuser 41 in the car through the part by which opening was carried out with the MAX cool damper 32. Since diffusers 42 and 43 are then closed by dampers 44 and 46, respectively, since internal pressure becomes high rather than the Maine duct 1, the wind ventilated does not flow into ducts 47 and 48 in a duct 47 and 48. Therefore, the cooled wind can perform cooling in the duct which serves as the form where the passage was shortened and has become an elevated temperature in a short time.

[0028] Next, in step 113, it distinguishes whether the temperature Td in the central face diffuser 41 is lower than the skin laying temperature T2. If not low, it is judged as "NO", and return is sent to step 11, sending the minimum electrical potential difference to the blower motor 12 is continued, and the minimum blast weight condition by the minimum rotation condition is maintained. Then, when it changes into such a condition, in step 113, it is judged as "YES", and moves to step 114, and only least-input-increment electrical-potential-difference deltaV makes the output voltage V1 to the blower motor 12 increase, since the temperature Td in a diffuser will become lower than the skin laying temperature T2, if the duct in the path in which even the diffuser 41 was shortened from the evaporator 2 etc. is cooled. And by distinguishing, when high, it judges it to be "YES" whether the newly set-up electrical potential difference V1 is higher than the highest programmed voltage V2, and it progresses to step 116. Moreover, the increment in V1 is repeated until judge it as "NO", return to step 112, only deltaV makes a programmed voltage V1 increase at step 114 again and it exceeds the highest programmed voltage V2, in being low. or [the increment in the blast weight according to the increment in a programmed voltage V1 in that case] -- from -- the cooling effect falls, since it is necessary to check so that blowdown temperature may not exceed skin temperature, it blows off at step 113 until it exceeds a maximum voltage, and the check of temperature Td is repeated. When a programmed voltage V1 exceeds a maximum voltage V2, it progresses to step 116, and Kaisei of the dampers 44 and 46 in both the side face diffuser is carried out. Then, Kaisei of the face damper 34 is carried out at step 117, and it is controlled to carry out the usual Tao control action as henceforth shown in drawing 31.

[0029] In addition, in step 106 in drawing 2 , although inside-and-outside mind inhalation Mohd was made into the bashful condition, if it is set as the condition of inhaling outside air temperature when the outside air temperature is lower than bashful **, still more efficient cooling control can be performed.

[0030]

[Effect of the Invention] So that clearly from the above explanation the conditioner of this invention The air duct with which the car was equipped, and the heat exchanger for air conditioning arranged in said air duct, In the conditioner for automobiles equipped with the blower which ventilates in said air duct, and two or more diffusers which ventilate the wind air-conditioned in said air duct A temperature detection means to detect the blowdown temperature in the diffuser formed in the center of an inner vehicle room front wall of said diffuser, A closing motion means to open and close the diffuser formed in inner vehicle room front wall both the sides of said diffuser, The driving means which drives said closing motion means is established. With said temperature detection means Since it considered as the configuration equipped with the detected control unit which blows off, closes said closing motion means by said driving means based on temperature, and controls the blast weight of said blower a little At the time of an elevated temperature, hot warm air does not blow off from a face diffuser at a stretch at the time of starting of an air conditioner, and to crew, in the car ventilates a cooling wind for a short time from a diffuser, and becomes possible [giving a comfortable feeling].

[Translation done.]

duct 49 for face blowdown are connected with the Maine duct 1. Furthermore from the face blowdown duct 49, the side face ducts 47 and 48 are installed towards vehicle room front wall both sides. The side face diffusers 42 and 43 are formed in the vehicle interior of a room at the point in the form which carried out opening at the vehicle indoor front wall. Moreover, the central face diffuser 41 is formed in the form which carried out opening from the duct 49 for face blowdown to the vehicle interior of a room towards the center in a vehicle indoor front wall. The dampers 44, 45, and 46 for opening and closing a diffuser are formed in each diffuser, the closing motion drive of each damper is carried out by actuators 81, 68, and 82, and the actuation is controlled by the control unit 90.

[0020] The dampers 35 and 36 for opening and closing the inflow of air by which the temperature control was carried out from the Maine duct 1, respectively are formed in the joining segment with the Maine duct 1 of the duct 71 for FOOT blowdown, and the defroster duct 72. The closing motion drive of the dampers 35 and 36 is carried out by the connected actuators 65 and 66, and the actuation is controlled by the control unit 90.

[0021] The face damper 34 for performing a ventilation switch into the duct 49 for face duct blowdown of the air in which the temperature control was carried out to the joining segment of the Maine duct 1 and the duct 49 for face blowdown by the abouchement of the MAX cool damper 32 for turning to the direct face duct 49 the cooling wind cooled by the evaporator 2 and the air warmed with the heater core 33 is formed. The drive of the MAX cool damper 64 and the face damper 34 is driven with actuators 64 and 67, and the actuation is controlled by the control unit 90.

[0022] The temperature setter 55 for setting up the sensor 52 which measures vehicle indoor bashful ** Tr, the sensor 53 which detects outside air temperature Tam, the sensor 54 which detects intensity of radiation Ts, and the temperature for which crew wishes is connected to the control unit 90. The sensor 51 which detects the temperature Td in the central face diffuser 41 which is furthermore one of the descriptions of this invention is connected to the control unit 90.

[0023] A control unit 90 is constituted by the so-called microcomputer system etc., and controls each actuator and the blower motor 12 based on the detecting signal of each above-mentioned sensor, and the setting room temperature by the room temperature setter 55.

[0024] Next, actuation is explained. Drawing 2 and drawing 3 are the flow charts about the control action of this equipment. Control action begins by starting of this equipment, and it sets to step 101 first. As distinction level as which the indoor high temperature T1 for setting up whether air-conditioning control in this invention explained below is performed when the temperature in the central face diffuser 41 is what more than times, and crew sense a feeling of cooling The ****** laying temperature T2 and the blower fan 11 Initial values set up beforehand, such as output voltage R/C least-input-increment deltaV to the highest programmed voltage V2 to the blower motor 12 for rotating the output voltage V1 to the blower motor 12 for making it rotate and the blower fan 11 with a maximum engine speed and the blower motor 12, with a control unit 90 It is read. In this example, T1= 50-degreeC, T2= 30-degreeC, V2=12V, and deltaV=1V are set up, for example.

[0025] Next, in step 102, data inputs, such as temperature detection from each sensor, are performed. That is, the room temperature Tset set up from the room temperature setter 55 is read, bashful ** Tr is detected from a sensor 52, outside air temperature Tam is detected from a sensor 53, and intensity of radiation Ts is read from a sensor 54. Furthermore, the temperature Td in the central face diffuser 41 is detected, and each data is inputted into a control device 90 by the sensor 51, respectively. Next, a refrigerating cycle is started in step 103 and a refrigerant is supplied to an evaporator 2 from the compressor which is not illustrated.

[0026] In step 104, the temperature Td in the face diffuser 41 distinguishes whether it is an elevated temperature from the indoor high temperature T1 in the condition. The usual target blowdown sky atmospheric temperature Tao control of the above-mentioned according to drawing 3 which distinguishes from "YES" at step 104 when the temperature Td in a diffuser 41 is an elevated temperature from the indoor high temperature T1, carries out control to steps 105-117 below, and does not use the diffuser temperature sensor 51 after that is performed. Moreover, by step 104, when the diffuser temperature Td is already less than [indoor high temperature T1], it distinguishes from "NO" at

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PRIOR ART

[Description of the Prior Art] Drawing 1 which is the block diagram of this invention is used and explained about the configuration of the conventional conditioner for automobiles. That is, the evaporator 2 and heater 33 which cool the air ventilated are arranged by the Maine duct 1. The blower fan 11 for ventilating an evaporator 2 in air is formed in the upstream of an evaporator 2, and a rotation drive is carried out by the blower motor 12. Furthermore, the damper 13 for an outside bashful switch to switch is formed [the open air or / whether it is crowded bashful twist picking and] in the air supplied to the blower fan 11, and drive control of the drive of a damper 13 is carried out by the control unit 90 with the actuators 61, such as a servo motor.
[0003] Point-to-point control of the air mix damper 31 is carried out to the opening location of arbitration by SA - BOMOTA 63 so that the air content which flows into a heater 33 with the air mix damper 31 may be adjusted and the air cooled by the evaporator 2 may become predetermined temperature.
[0004] The duct 71 for FOOT blowdown for ventilating crew's step and the defroster duct 72, and the duct 49 for face blowdown are connected with the Maine duct 1. Furthermore, the side face ducts 47 and 48 are installed by the face blowdown duct 49 towards vehicle room front wall both sides. The face diffusers 42 and 43 are formed in the vehicle interior of a room at the point in the form which carried out opening at the vehicle indoor front wall. Moreover, the central face diffuser 41 is formed in the duct 49 for face blowdown towards the center in a vehicle indoor front wall in the form which carried out opening to the vehicle interior of a room. The dampers 44, 45, and 46 for opening and closing a diffuser are formed in each diffuser, and each damper is operated by hand control, respectively.
[0005] The dampers 35 and 36 for opening and closing the inflow of air by which the temperature control was carried out from the Maine duct 1, respectively are formed in the joining segment with the Maine duct 1 of the duct 71 for FOOT blowdown, and the defroster duct 72. Dampers 35 and 36 are driven with the connected actuators 65 and 66, and the actuation is controlled by the control unit 90.
[0006] The face damper 34 for performing a ventilation switch into the duct 49 for face blowdown of the air in which the temperature control was carried out to the joining segment of the Maine duct 1 and the duct 49 for face blowdown by the abouchement of the MAX cool damper 32 for turning to the duct 49 for direct face blowdown the cooling wind cooled by the evaporator 2 and the air warmed with the heater core 33 is formed. The drive of the MAX cool damper 32 and the face damper 34 is driven with actuators 64 and 67, and the actuation is controlled by the control unit 90.
[0007] The temperature setter 55 for setting up the sensor 52 which measures vehicle indoor bashful ** Tr, the sensor 53 which detects outside air temperature Tam, the sensor 54 which detects intensity of radiation Ts, and the temperature for which crew wishes further is connected to the control unit 90.
[0008] A control unit 90 is constituted by the so-called microcomputer system etc., and controls each actuator and the blower motor 12 based on the setting room temperature Tset by the above-mentioned detecting signal and the above-mentioned room temperature setter 55 of each sensor.
[0009] In such a configuration, the control approach as shown in the flow chart in drawing 4 was enforced conventionally. That is, initial setting, such as a setup of the multiplier which the initial state in

each diffuser sets up or calculates in step 201, is performed, and in step 202, from each sensor, the data of bashful ** Tr, outside air temperature Tam, and intensity of radiation Ts are read, and it is inputted into a control unit 90. Moreover, the laying temperature Tset which crew wishes is read from the temperature setter 55. Next, at step 203, target blowdown sky atmospheric temperature Tao calculates from these data according to the function f1 set up beforehand. Subsequently, the opening Sw of the air mix damper 31 corresponding to target blowdown sky atmospheric temperature Tao calculates at step 204 based on a function f2. Subsequently, in step 205, the output voltage to the blower motor 12 corresponding to said Tao is set up, inside-and-outside mind inhalation opening Mohd is set up at step 206, and positioning of the inside-and-outside mind switch damper 13 is performed. And diffuser Mohd is set up at step 207. Four Mohd is set up corresponding to Tao, closing motion control of the damper corresponding to each mode etc. switches diffuser Mohd automatically, and he is controlled. There are MAXFACE Mohd, FACE Mohd, bilevel (B/L) Mohd, and FOOT Mohd as Mohd from the low order of Tao. MAXFACE Mohd is in the condition that the face damper 34 and dampers 35 and 36 are closed, and Kaisei of the MAX cool damper 32 is carried out. FACE Mohd It is in the condition which closes the MAX cool damper 32 in FACE Mohd, and carries out Kaisei of the face damper 34. A bilevel mode In the condition that dampers 32 and 36 close and Kaisei of the dampers 35 and 34 is carried out The way of the air ventilated to the duct 49 for face blowdown so that the flow rate to the heater core 33 may be adjusted by opening adjustment of the air mix damper 31 and the wind cooled by the evaporator 2 may be in a keeping-one's-head-cool-and-feet-warm condition to crew The wind by which the temperature control was carried out so that it might be ventilated in the condition that temperature is lower than the air ventilated by the FOOT duct is supplied to the duct 49 for face blowdown, and the FOOT duct 71. FOOT Mohd is Mohd in the condition that all dampers other than damper 35 for FOOT ducts are closed.

[0010] If diffuser Mohd corresponding to Tao calculated in step 207 is set up, air-conditioning control will be henceforth carried out continuously by step 202 return and by inputting the data from each sensor again, repeating the control action to step 207 and performing it.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the conditioner for automobiles which ventilates an air-conditioning wind.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] So that clearly from the above explanation the conditioner of this invention The air duct with which the car was equipped, and the heat exchanger for air conditioning arranged in said air duct, In the conditioner for automobiles equipped with the blower which ventilates in said air duct, and two or more diffusers which ventilate the wind air-conditioned in said air duct A temperature detection means to detect the blowdown temperature in the diffuser formed in the center of an inner vehicle room front wall of said diffuser, A closing motion means to open and close the diffuser formed in inner vehicle room front wall both the sides of said diffuser, The driving means which drives said closing motion means is established. With said temperature detection means Since it considered as the configuration equipped with the detected control unit which blows off, closes said closing motion means by said driving means based on temperature, and controls the blast weight of said blower a little At the time of an elevated temperature, hot warm air does not blow off from a face diffuser at a stretch at the time of starting of an air conditioner, and to crew, in the car ventilates a cooling wind for a short time from a diffuser, and becomes possible [giving a comfortable feeling].

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] A room temperature is high, and it becomes low, and when left by the car all over the summer flame world, since there is very much intensity of radiation, the target blowdown temperature Tao calculated in step 203 switches to the location (location shown as the continuous line in drawing 1) which intercepts the inflow of the air to the heater core 33, and is positioned [the target air mix damper opening Sw in step 204 serves as max, and] in such control. Furthermore in step 205, the programmed voltage to the blower motor 12 turns into a maximum voltage, the blower fan 11 is changed into the condition of carrying out the maximum airflow discharge, and the inside-and-outside mind switch damper 13 is switched to the location (location shown by the dotted line in drawing 1) which intercepts the inhalation from the open air so that it may be in the condition that inside-and-outside mind inhalation opening Mohd incorporates only inner mind at step 206. And in step 207, diffuser Mohd turns into MAXFACE Mohd, and the closing motion dampers 36 and 35 in the defroster duct 72 and the FOOT duct 71 are switched to a closing location (location shown as the continuous line in drawing 1) which intercepts the inflow of the air to each duct, and it is positioned. Furthermore, the face damper 34 is closed (location shown as the continuous line in drawing 1), and setting control is carried out so that the chisel of the cooling style may be ventilated with the maximum blast weight only from the face diffusers 41, 42, and 43 considering the MAX cool damper 32 as an open condition (location of the continuous line in drawing 1).

[0012] Therefore, during summer flame world parking, by solar radiation, in the condition that each device of the vehicle interior of a room, the duct of an air conditioner, etc. serve as an elevated temperature of 50 degrees or more, if a conditioner operates like the above, the hot air which was piling up in the duct will blow off from each face diffusers 41, 42, and 43 to in the car at a stretch. Furthermore, such a hot wind blows off until each whole device and whole duct of an air conditioner get cold, and unless it passes for a while, desired cold blast does not blow off. Therefore, a result which gives displeasure further by spraying by the hot wind of an air conditioner to crew while in the car is an elevated temperature is brought. Moreover, although there is the approach of preventing crew's closing the face duct entrances 41 and 42 and 43 grades manually, and spraying him on **** etc. in warm air as an approach of avoiding such a thing each time In such a case, it learns, if it does not work to it, extending a hand to the diffuser which a hand cannot reach easily each time, there is complicatedness, and in that case, for a while, the direct ventilation to crew of the cooling style is interrupted, and the elevated-temperature condition of the vehicle interior of a room must be put up with too. Moreover, since it does not know when ventilation changed into the cooling condition in that case, there is a fault which cannot perform a timely ventilation switch, either.

[0013] When this invention is made in view of the above-mentioned situation and takes the car in a summer flame world especially, it ventilates a cooling wind for a short time to crew at the time of starting of an air conditioner, and aims at performing ventilation control which gives a comfortable feeling.

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MEANS

[Means for Solving the Problem] The air duct with which the car was equipped in order that this invention might attain the above-mentioned purpose, In the conditioner for automobiles equipped with the heat exchanger for air conditioning arranged in said air duct, the blower which ventilates in said air duct, and two or more diffusers which ventilate the wind air-conditioned in said air duct A temperature detection means to detect the blowdown temperature in the diffuser formed in the center of an inner vehicle room front wall of said diffuser, A closing motion means to open and close the diffuser formed in inner vehicle room front wall both the sides of said diffuser, The driving means which drives said closing motion means is established, it blows off, said closing motion means is closed by said driving means based on temperature, and the technical means of having the control unit which was detected by said temperature detection means and which controls the blast weight of said blower a little are provided.

[Translation done.]

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EXAMPLE

[Example] This invention is explained based on the example shown in drawing below. Drawing 1 is the block diagram showing one example of the equipment which carries out this invention.
[0017] The evaporator 2 and heater 33 which cool the air ventilated are arranged by the Maine duct 1. The blower fan 11 for ventilating an evaporator 2 in air is formed in the upstream of an evaporator 2, and a rotation drive is carried out by the blower motor 12. The damper 13 for an outside bashful switch to switch is formed [the open air or / whether it is crowded bashful twist picking and] in the air furthermore supplied to the blower fan 11, and drive control of the drive of a damper 13 is carried out by the control unit 90 with the driving gears 61, such as a servo motor.
[0018] Point-to-point control of the air mix damper 31 is carried out to the opening location of arbitration by SA - BOMOTA 63 so that the air content which flows into a heater 33 with the air mix damper 31 may be adjusted and the air cooled by the evaporator 2 may become predetermined temperature.
[0019] The duct 71 for FOOT blowdown for ventilating crew's step and the defroster duct 72, and the duct 49 for face blowdown are connected with the Maine duct 1. Furthermore from the face blowdown duct 49, the side face ducts 47 and 48 are installed towards vehicle room front wall both sides. The side face diffusers 42 and 43 are formed in the vehicle interior of a room at the point in the form which carried out opening at the vehicle indoor front wall. Moreover, the central face diffuser 41 is formed in the form which carried out opening from the duct 49 for face blowdown to the vehicle interior of a room towards the center in a vehicle indoor front wall. The dampers 44, 45, and 46 for opening and closing a diffuser are formed in each diffuser, the closing motion drive of each damper is carried out by actuators 81, 68, and 82, and the actuation is controlled by the control unit 90.
[0020] The dampers 35 and 36 for opening and closing the inflow of air by which the temperature control was carried out from the Maine duct 1, respectively are formed in the joining segment with the Maine duct 1 of the duct 71 for FOOT blowdown, and the defroster duct 72. The closing motion drive of the dampers 35 and 36 is carried out by the connected actuators 65 and 66, and the actuation is controlled by the control unit 90.
[0021] The face damper 34 for performing a ventilation switch into the duct 49 for face duct blowdown of the air in which the temperature control was carried out to the joining segment of the Maine duct 1 and the duct 49 for face blowdown by the abouchement of the MAX cool damper 32 for turning to the direct face duct 49 the cooling wind cooled by the evaporator 2 and the air warmed with the heater core 33 is formed. The drive of the MAX cool damper 64 and the face damper 34 is driven with actuators 64 and 67, and the actuation is controlled by the control unit 90.
[0022] The temperature setter 55 for setting up the sensor 52 which measures vehicle indoor bashful ** Tr, the sensor 53 which detects outside air temperature Tam, the sensor 54 which detects intensity of radiation Ts, and the temperature for which crew wishes is connected to the control unit 90. The sensor 51 which detects the temperature Td in the central face diffuser 41 which is furthermore one of the descriptions of this invention is connected to the control unit 90.
[0023] A control unit 90 is constituted by the so-called microcomputer system etc., and controls each

actuator and the blower motor 12 based on the detecting signal of each above-mentioned sensor, and the setting room temperature by the room temperature setter 55.

[0024] Next, actuation is explained. Drawing 2 and drawing 3 are the flow charts about the control action of this equipment. Control action begins by starting of this equipment, and it sets to step 101 first. As distinction level as which the indoor high temperature T1 for setting up whether air-conditioning control in this invention explained below is performed when the temperature in the central face diffuser 41 is what more than times, and crew sense a feeling of cooling The ****** laying temperature T2 and the blower fan 11 Initial values set up beforehand, such as output voltage R/C least-input-increment deltaV to the highest programmed voltage V2 to the blower motor 12 for rotating the output voltage V1 to the blower motor 12 for making it rotate and the blower fan 11 with a maximum engine speed and the blower motor 12, with a control unit 90 It is read. In this example, T1= 50-degreeC, T2= 30-degreeC, V2=12V, and deltaV=1V are set up, for example.

[0025] Next, in step 102, data inputs, such as temperature detection from each sensor, are performed. That is, the room temperature Tset set up from the room temperature setter 55 is read, bashful ** Tr is detected from a sensor 52, outside air temperature Tam is detected from a sensor 53, and intensity of radiation Ts is read from a sensor 54. Furthermore, the temperature Td in the central face diffuser 41 is detected, and each data is inputted into a control device 90 by the sensor 51, respectively. Next, a refrigerating cycle is started in step 103 and a refrigerant is supplied to an evaporator 2 from the compressor which is not illustrated.

[0026] In step 104, the temperature Td in the face diffuser 41 distinguishes whether it is an elevated temperature from the indoor high temperature T1 in the condition. The usual target blowdown sky atmospheric temperature Tao control of the above-mentioned according to drawing 3 which distinguishes from "YES" at step 104 when the temperature Td in a diffuser 41 is an elevated temperature from the indoor high temperature T1, carries out control to steps 105-117 below, and does not use the diffuser temperature sensor 51 after that is performed. Moreover, by step 104, when the diffuser temperature Td is already less than [indoor high temperature T1], it distinguishes from "NO" at step 104, and the usual target blowdown sky atmospheric temperature Tao control which was mentioned above, without carrying out control to steps 105-117 is carried out.

[0027] If distinguished from "YES" at step 104, it is directed next at step 105 that the air mix damper 31 is on the MAXCOOL side, i.e., the maximum opening condition, from a control device 90 to an actuator 63. Next, drive control is carried out so that it may be in the suction condition of a bashful chisel about inside-and-outside mind absorption opening Mohd at step 106 and the inside-and-outside mind switch damper 13 may be positioned in the location (location shown by the dotted line in drawing 1) which intercepts open air side inhalation opening. Next, in step 107, the damper 35 for FOOT blowdown ducts is closed, in order to intercept the ventilation from a defroster diffuser at step 108, a damper 36 is closed (location shown as the continuous line in drawing 1), Kaisei (location shown as the continuous line in drawing 1) of the MAX cool damper 32 is carried out at step 109, and the face damper 34 is closed in step 110 (location shown as the continuous line in drawing 1). Furthermore in step 111, the closing motion dampers 44 and 46 in both the side face diffusers 42 and 43 are closed (location shown as the continuous line in drawing 1). The minimum electrical potential difference is outputted to the output voltage V1 to the blower motor 12 from a control device 90 at step 112 by the condition, and the blower fan 11 rotates with a minimum engine speed. Then, since the face diffuser in this equipment is in the condition of having been closed, except for the central face diffuser 41, airflow more nearly little than the blower fan 11 is ventilated, and it is cooled by the evaporator 2 and ventilated from the direct diffuser 41 in the car through the part by which opening was carried out with the MAX cool damper 32. Since diffusers 42 and 43 are then closed by dampers 44 and 46, respectively, since internal pressure becomes high rather than the Maine duct 1, the wind ventilated does not flow into ducts 47 and 48 in a duct 47 and 48. Therefore, the cooled wind can perform cooling in the duct which serves as the form where the passage was shortened and has become an elevated temperature in a short time.

[0028] Next, in step 113, it distinguishes whether the temperature Td in the central face diffuser 41 is lower than the skin laying temperature T2. If not low, it is judged as "NO", and return is sent to step 11, sending the minimum electrical potential difference to the blower motor 12 is continued, and the minimum blast weight condition by the minimum rotation condition is maintained. Then, when it changes into such a condition, in step 113, it is judged as "YES", and moves to step 114, and only least-input-increment electrical-potential-difference deltaV makes the output voltage V1 to the blower motor 12 increase, since the temperature Td in a diffuser will become lower than the skin laying temperature T2, if the duct in the path in which even the diffuser 41 was shortened from the evaporator 2 etc. is cooled. And by distinguishing, when high, it judges it to be "YES" whether the newly set-up electrical potential difference V1 is higher than the highest programmed voltage V2, and it progresses to step 116. Moreover, the increment in V1 is repeated until judge it as "NO", return to step 112, only deltaV makes a programmed voltage V1 increase at step 114 again and it exceeds the highest programmed voltage V2, in being low. or [the increment in the blast weight according to the increment in a programmed voltage V1 in that case] -- from -- the cooling effect falls, since it is necessary to check so that blowdown temperature may not exceed skin temperature, it blows off at step 113 until it exceeds a maximum voltage, and the check of temperature Td is repeated. When a programmed voltage V1 exceeds a maximum voltage V2, it progresses to step 116, and Kaisei of the dampers 44 and 46 in both the side face diffuser is carried out. Then, Kaisei of the face damper 34 is carried out at step 117, and it is controlled to carry out the usual Tao control action as henceforth shown in drawing 31.

[0029] In addition, in step 106 in drawing 2 , although inside-and-outside mind inhalation Mohd was made into the bashful condition, if it is set as the condition of inhaling outside air temperature when the outside air temperature is lower than bashful **, still more efficient cooling control can be performed.

[Translation done.]

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

OPERATION

[Function] Since the conditioner for automobiles by this invention detects the temperature of the wind discharged from a diffuser and controls closing motion of blast weight and a diffuser based on the detected temperature So that in the car may be ventilated by the front wall in the car only from the diffuser formed in the center at the time of an elevated temperature It acts so that the wind cooled from the diffuser formed in the center of an in-the-car front wall may be ventilated to crew, at the same time it closes the closing motion means of both the side diffuser formed in the front wall in the car, it sets up the blast weight of a blower a little and an air conditioner starts.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The whole air-conditioner block diagram for automobiles in this invention.
[Drawing 2] The pre-stage of the control flow chart in this equipment.
[Drawing 3] The post-stage of the control flow chart in this equipment.
[Drawing 4] The control flow chart Fig. in the conventional air conditioner.
[Description of Notations]
1 Maine Duct
2 Evaporator
11 Blower Fan
12 Blower Motor
44 46 Damper
51 Central Face Diffuser Temperature Sensor
81 82 Actuator for a damper drive
90 Control Unit

[Translation done.]

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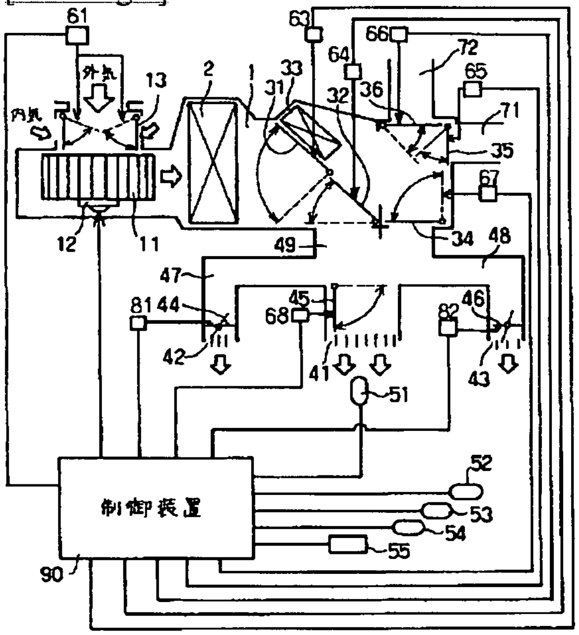
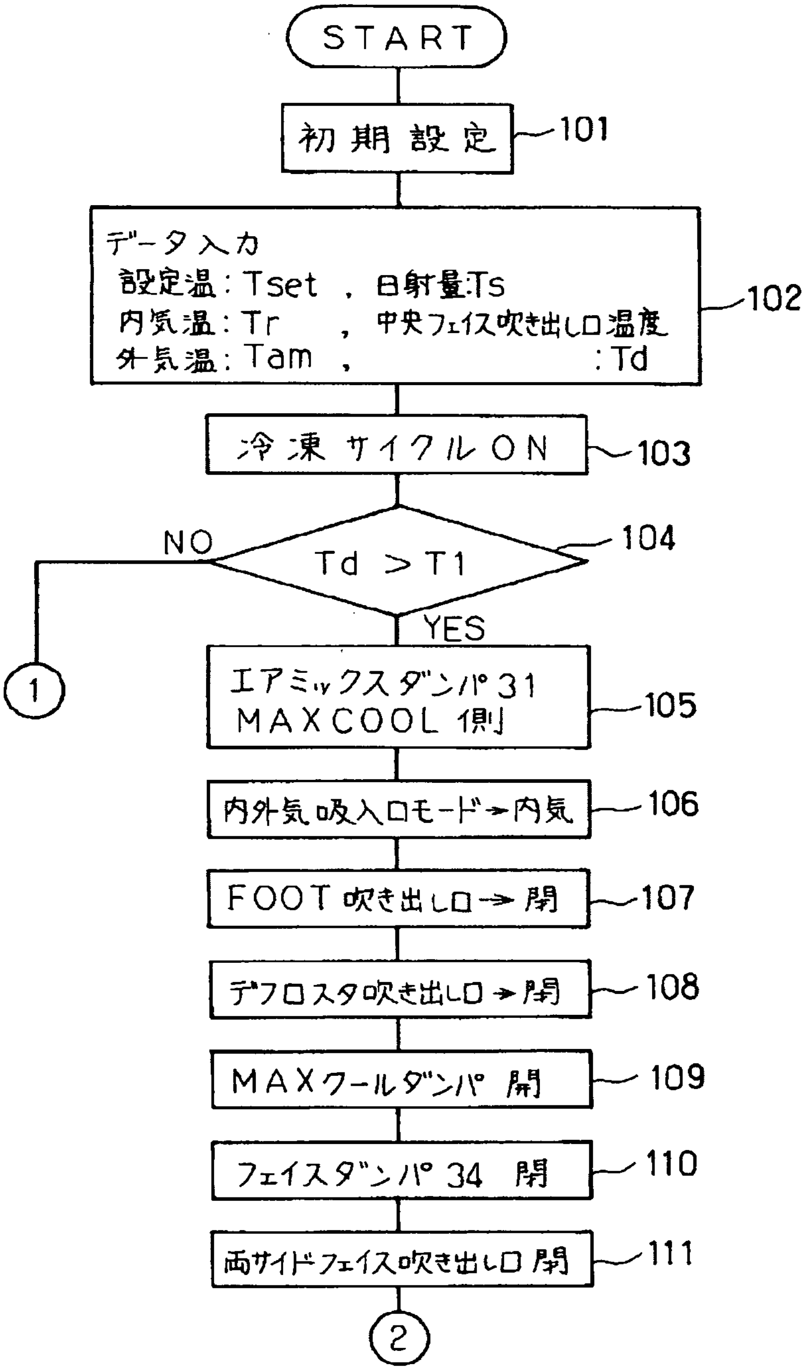
DRAWINGS

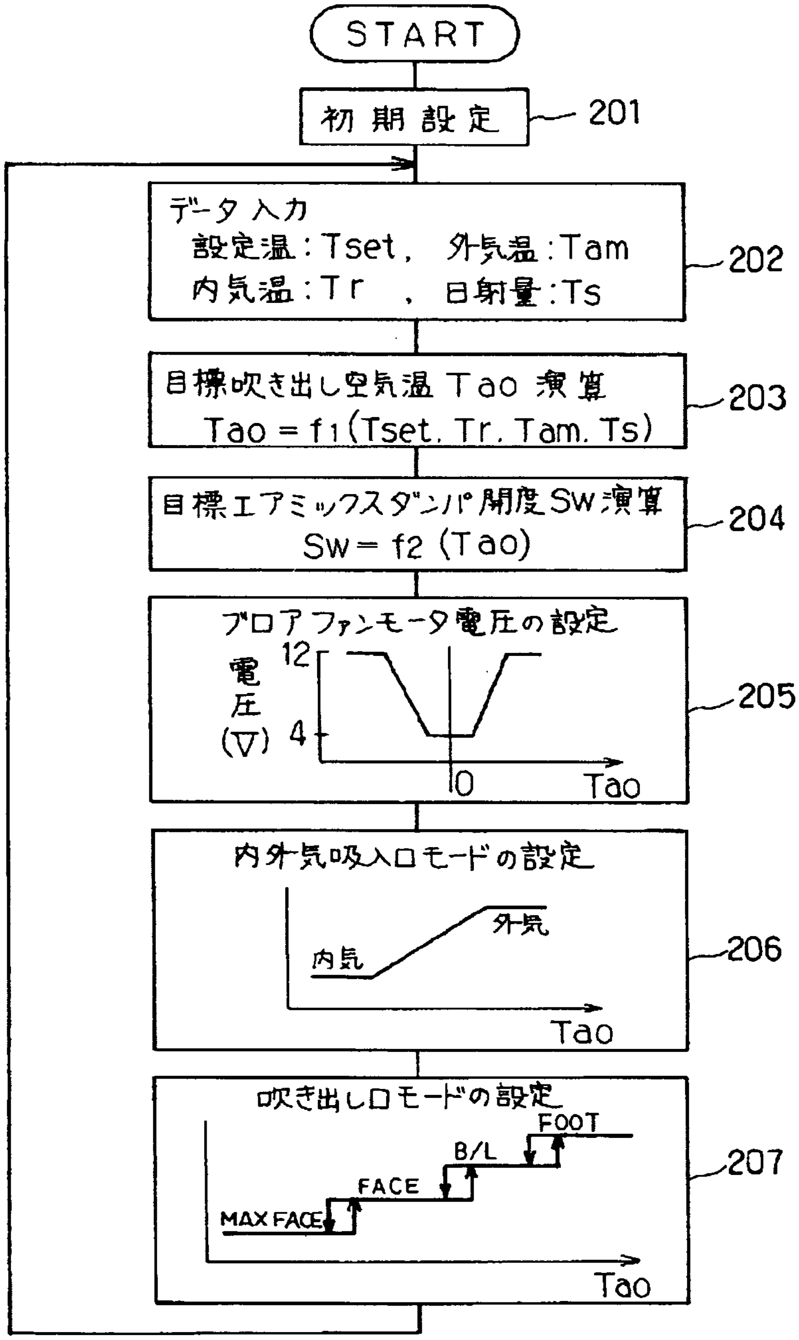
[Drawing 1]



[Drawing 3]


START
初期設定
101
データ入力
設定温：Tset ，日射量：Ts
内気温：Tr ，中央フェイス吹き出し口温度
外気温：Tam ， ：Td
102
冷凍サイクルON
103
Td ＞T1
104
NO
YES
1
エアミックスダンパ31
MAXCOOL側
105
内外気吸入口モード→内気
106
FOOT吹き出し口→閉
107
デフロスタ吹き出し口→閉
108
MAXクールダンパ 開
109
フェイスダンパ34 開
110
両サイドフェイス吹き出し口 開
111
2

[Drawing 4]



[Translation done.]